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Claim 1 (amended): A balancer for use in combination with a rotating assembly, said balancer comprising:

at least one movable member which is removably deployed upon said rotating assembly and which is effective to selectively balance said rotating assembly; and

a controller, coupled to said movable member and adapted to calculate an influence coefficient value and to periodically modify said influence coefficient value and to cause said movable member to move in accordance with said calculated influence coefficient value and said modified value effective to balance said rotating assembly, wherein said influence coefficient value is calculated by recursive exponentially weighted averaging and two adaptive parameters which are adjusted during each of a plurality of control iterations.

Claim 2 (previously presented): A balancer for use in combination with a tool assembly of a certain type and which moves at a certain speed, said balancer comprising:

at least one movable member which is removable deployed upon said tool assembly and which is effective to selectively balance said tool assembly;

a vibration sensor which senses a first amount of vibration of said tool assembly; and

a controller, coupled to said at least one movable member and to said vibration sensor said controller being adapted to recognize said certain type and based upon said certain type to calculate a second amount of vibration and to compare said first amount of vibration with said second amount of vibration and to move said tool assembly effective to reduce said first amount of vibration when said first amount of vibration exceeds said second amount of vibration.

Claim 3 (previously presented): A balancer for use in combination with a tool assembly and which moves at a certain speed, said balancer comprising:

at least one movable member which is removable deployed upon said tool assembly and which is effective to selectively balance said tool assembly;

a vibration sensor which senses a first amount of vibration of said tool assembly in combination with some certain measurement noise; and

a controller, coupled to said at least one movable member and to said vibration sensor said controller being adapted to recognize said certain measurement noise and based upon certain measurement noise to calculate a second amount of vibration and to compare said first amount of vibration with said second amount of vibration and to move said tool assembly effective to reduce said first amount of vibration when said first amount of vibration exceeds said second amount of vibration.

Claim 4 (previously presented): A balancer for use in combination with a tool assembly, which moves at a certain speed and which vibrates with a certain vibration level, said balancer comprising:

at least one movable member movably deployed upon said balancer; and

a controller operatively connected to said first and to said second movable members and adapted to move at least one movable member effective to balance said tool assembly without substantially increasing said vibration level.

Claim 5 (previously presented): A balancer adapted for use upon a moving member, said balancer comprising:

a movable member adapted to selectively balance said moving member upon the occurrence of a certain level of vibration of said moving member which exceeds a certain amount; and

a controller adapted to periodically change said certain amount.

Claim 6 (previously presented): A method of balancing a tool assembly by selectively employing a balance weight correction to said tool assembly, said method comprising the steps of:

employing a first balance weight correction to said tool assembly;

measuring an amount of vibration associated with said balance tool assembly;

estimating an influence coefficient value of said tool assembly by use of variable parameters;

dividing said measured amount of vibration by said estimate influence coefficient thereby creating a certain value;

multiplying said certain value by a gain parameter value, thereby creating a second certain value;

subtracting said second certain value from said first balance weight correction; and

applying said new balance weight correction to said tool assembly.

Claim 7 (previously presented): The method of Claim 5 wherein said step of estimating said influence coefficient comprises the steps of:

providing a previously estimated influence coefficient value;

calculating a currently estimated influence coefficient value;

multiplying said currently estimated influence coefficient by a certain value, thereby creating a first new value;

subtracting said certain value from one, thereby creating a second new value;

multiplying said previously estimated influence coefficient value by said second new value, thereby creating a third new value; and

adding said second new value to said third new value.

Claim 8 (previously presented): The method of claim 6 wherein said certain value equals zero.

Claim 9 (previously presented): The method of Claim 6 where said certain value equals one.

Claim 10 (previously presented): The method of Claim 6 wherein said certain value equals a value between zero and one.

Claim 11 (previously presented): A method of balancing a tool assembly comprising:

calculating a normalized measure of influence coefficient estimation convergence error;

defining at least one parameter as a function of said normalized measure of influence coefficient error;

providing a balancing rotor;

movably placing said balancing rotor upon said tool assembly; and

moving said balancing rotor in accordance with said at least one parameter thereby balancing said tool assembly.

Claim 12 (previously presented): The method of Claim 11 wherein said function is exponential.

Claim 13 (previously presented): A method to correct a certain amount of unbalance of a rotating member, said method comprising the steps of:

calculating said certain amount of unbalance correction;

reducing said calculated certain amount of unbalance correction by a second certain amount; and

applying said second certain amount of unbalance correction to said rotating member.

Claim 14 (previously presented): A balancer adapted for use upon a rotating member, said balancer comprising:

First and second movable members deployed upon said rotating member; and

a controller, coupled to said first and second moveable members and which is adapted to move said movable members to substantially prevent an increase in the vibration level during the balancing of said rotating member.

Claim 15 (previously presented): The balancer of Claim 14 wherein said controller is further adapted to provide a sequence of movements of said first and second movable members effective to allow the estimate of an influence coefficient measure of said rotating member to be made.

Claim 16 (previously presented): The balancer of Claim 14 where said controller is further adapted to dynamically change said sequence of movements to a new sequence of movement depending upon a measured amount of vibration.

Claim 17 (previously presented): A balancer assembly having a plurality of vibration sensors, each of said vibration sensors generating a vibration signal, said balancer assembly adapted to allow a user to specify which of said vibration signals are to be minimized as a balance correction is made.

Claim 18 (previously presented): A balancer which selectively balances a rotating assembly which vibrates in response to a certain amount of unbalancing, said balancer comprising:

a plurality of sensors, each of said sensors generating a vibration signal;

at least one moveable member deployed upon said rotating assembly; and

a controller adapted to selectively move said movable member to a position which minimizes the combination of the amount of vibration of said rotating assembly, the amount of unbalance correction and a time period in which said unbalance correction is applied to said rotating assembly.

Claim 19 (canceled) The balancer of claim 1 wherein said influence coefficient value is calculated by recursive exponentially weighted averaging and two adaptive parameters which are adjusted during each of a plurality of control iterations.

Claim 20 (previously presented): A balancer for use in combination with a rotating assembly, said balancer comprising:

at least one movable member which is removably deployed upon said rotating assembly and which is effective to selectively balance said rotating assembly; and

a controller, coupled to said movable member and adapted to calculate an influence coefficient value and to adjust two adaptive parameters during at least two control iterations, wherein said controller is effective to cause said at least one movable member to move in accordance with said influence coefficient value and said two adaptive parameters to balance said rotating assembly.

<u>Claim 21 (previously presented):</u> The balancer of claim 20 wherein said controller calculates said influence coefficient value through recursive exponentially weighted averaging.

<u>Claim 22 (previously presented):</u> The balancer of claim 20 wherein said two adaptive parameters are a gain parameter and a forgetting factor.

<u>Claim 23 (previously presented):</u> The balancer of claim 22 wherein said gain parameter is within a range of zero to one in value.

<u>Claim 24 (previously presented):</u> The balancer of claim 22 wherein said forgetting factor is within a range of zero to one in value.

<u>Claim 25 (previously presented):</u> The balancer of claim 22 wherein said controller automatically adjusts both said gain parameter and said forgetting factor during each of said control iterations.

<u>Claim 26 (previously presented):</u> The balancer of claim 20 further comprising at least one vibration sensor which is communicatively coupled to said controller and is disposed in close proximity to said rotating assembly, wherein said at least one vibration sensor communicates an amount of imbalance of said rotating assembly to said controller.

<u>Claim 27 (previously presented):</u> The balancer of claim 26 wherein said controller calculates said influence coefficient value using said amount of imbalance.

<u>Claim 28 (previously presented):</u> The balancer of claim 26 wherein said amount of imbalance is communicated as a complex phasor having a certain phase angle.

<u>Claim 29 (previously presented):</u> A balancer for use in combination with a rotating tool assembly, which rotates at a certain cutting speed and has a certain amount of imbalance at said certain cutting speed, said balancer comprising:

at least one movable member which is deployed upon said tool assembly, said at least one movable member having a certain weight distribution, wherein said at least one movable member is effective to be repositioned upon said tool assembly to cause said certain weight distribution to balance said amount of imbalance;

a vibration sensor which is effective to determine said amount of imbalance and to generate an error signal which represents said amount of imbalance; and

a controller which is coupled to said at least one movable member and said vibration sensor, wherein said controller receives said error signal and calculates an influence coefficient value to select an adaptive gain parameter and an adaptive forgetting factor which are used to calculate a position at which said at least one movable member is moved upon said tool assembly in order to balance said tool assembly.

Claim 30 (previously presented): The balancer of claim 29 wherein said controller calculates said influence coefficient value at said certain cutting speed.

Claim 31 (previously presented): The balancer of claim 29 wherein said gain parameter is within a range of zero to one in value.

Claim 32 (previously presented): The balancer of claim 29 wherein said forgetting factor is within a range of zero to one in value.

Claim 33 (previously presented): The balancer of claim 29 wherein said controller automatically adjusts both said gain parameter and said forgetting factor during each of a plurality of control iterations.

Claim 34 (amended): A method for balancing a rotatable tool assembly, said method comprising the steps of:

measuring an amount of imbalance within said tool assembly during a certain control interval;

calculating an influence coefficient value during said certain control interval;

adjusting two adaptive parameters based upon said calculated influence coefficient;

providing a balancing rotor which may be removably deployed upon said tool assembly;

defining a correction movement of said balancing rotor as a function of said influence coefficient value; and

causing said balancing rotor to follow said correction movement.

Claim 35 (previously presented): The method of claim 34 wherein said two adaptive parameters are a gain parameter and a forgetting factor.

Claim 36 (amended): The method of claim 35 wherein said step of adjusting two adaptive parameters based upon said calculated influence coefficient during said certain control interval further comprises the steps of:

determining an accuracy of said calculated influence coefficient value;

increasing said gain parameter and reducing said forgetting factor if said calculated influence coefficient value is relatively accurate; and

decreasing said gain parameter and increasing said forgetting factor if said calculated influence coefficient value is relatively inaccurate.

Claim 37 (amended): The method of claim 34 further comprising the step of determining a vibrational value error for each control iteration, wherein said vibrational error value is the sum of all disturbances present at a particular control iteration and the

multiplicative product of any correction movement made during said particular control iteration.

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By:____________________________

Alina Tolkachier
For:
Law Offices of John Chupa & Associates, P.C.
28535 Orchard Lake Rd. Ste. 50
Farmington Hills, MI 48334